

AIR WAR COLLEGE

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The Complexity of Threats to Nuclear Strategic Deterrence Posture

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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7 February 2017

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Biography

Colonel William “Mike” Fairclough is assigned to the Air War College, Air University, Maxwell AFB, AL, and is a native of Concord, CA. In 1994, commissioned as an Engineer Officer, Mike has served in various command and staff positions in primarily overseas duty assignments. In 2005, after training and commencement of duties as a Force Management Officer, Mike performed various staff positions at the operational and strategic level of command, deploying to Southwest Asia twice in support of Operation Iraqi Freedom.

Colonel Fairclough’s civilian education includes a Bachelor of Science degree in City and Regional Planning from California Polytechnic State University, San Luis Obispo, CA, and a Master of Arts degree in Military Studies from American Military University, Charles Town, West Virginia.

Colonel Fairclough’s military education includes the Engineer Officer Basic Course, the Captains Career Course, Combined Arms Services and Staff School, Airborne School, Air Assault School, Jumpmaster School, Command and General Staff College, the Force Management Qualification Course, and the Joint and Combined Warfighting School.

Colonel Fairclough’s military awards include the Bronze Star Medal (1 Oak Leaf Cluster), Defense Meritorious Service Medal, Meritorious Service Medal (2 Oak Leaf Clusters), Army Commendation Medal (1 Silver Oak Leaf), Army Achievement Medal (2 Oak Leaf Clusters), Iraq Campaign Medal (2 Campaign Stars), Parachutist Badge, and Air Assault Badge.

Abstract

Taking into account the enduring and pervasive nature of complexity in the global security environment, and the threats that will likely evolve, this paper attempted to answer the question of how current and future threats in the global security environment affect nuclear strategic deterrence posture. The purpose of this research was to examine in detail the complexity of foreseeable threats to effective nuclear strategic deterrence posture. The methodology utilized to conduct this study and test the hypothesis was a qualitative research approach using the dependent variable of nuclear strategic deterrence posture, and four independent variables of the future global security environment, a status quo but things are improving, a status quo but things are getting worse, and the occurrence of a game-changing event. Findings revealed that numerous complexities of the future global security environment as well as intricacies involving each scenario indelibly affect nuclear strategic deterrence posture. Ultimately, the strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years.

I. INTRODUCTION

No one was going to be the winner in such a nuclear war. The destruction might be such that we might have ultimately to go back to bows and arrows.

Eisenhower, 1956

For good reason, a wealth of scholarly information is available that discusses the topic of US efforts at nuclear strategic deterrence as the concept itself elicits an emotional response from a wide range of actors. These include key stakeholders such as the US who hold the power of thermonuclear weapons, to non-state actors or belligerents, who wish to acquire such power. Even the relatively uninformed now inquire about nuclear strategic deterrence and question how such a nebulous concept has persevered for almost seven decades. Today, once again deterrence strategists are "...faced with novel and baffling problems to which we try to adapt ready-made strategic ideas inherited from the past. If we examine the origin and development of these ideas, we may be better able to judge whether they actually fit the present and future."¹

Ultimately, regardless of ownership or primacy, as long as nuclear weapons exist in the world today and in the future, the US must understand and contend with a host of threats in the future global security environment to deter adversaries and ensure the country maintains an effective nuclear strategic deterrence posture. Unfortunately, attempting to describe and predict the future global security environment is inarguably an arduous task. Technology along with weapons proliferation has rapidly advanced, disparate ideologies and threats have continued to change, and globalization is now an indelible part of life.² With all the changes that continue to occur, it is a certainty that complexity will remain the norm in describing the global joint

¹ Brodie, Bernard, *Strategy in the Missile Age*. Santa Monica: RAND Corporation, (2007): viii

² Globalization is defined here as an increasing rapid flow of ideas, information, and money.

operating environment (JOE), and with it, the capability of the US to maintain effective strategic deterrence.

Current Trends in the Joint Operating Environment

Primarily four deleterious trends exist in the current JOE that influence the posture of the US nuclear enterprise to include: Nuclear weapons modernization and technological innovation efforts by China and Russia; Democratic People's Republic of Korea (DPRK) nuclear weapons proliferation efforts and ongoing belligerence; instability in South Asia, and; Iran's persistent pledge to procure nuclear weapons and export terrorism.

Although both the PRC and Russia remain as members of the Nuclear Nonproliferation Treaty (NPT) each have robust nuclear arsenals, continue nuclear weapons modernization efforts, and more importantly, continue to pursue more effective long-range weapons delivery platforms and hypersonic technology. The DPRK continue to pursue nuclear weapons materiel and technology, more effective long-range weapons delivery, and overall propagate regional instability. In South Asia, "India and Pakistan have demonstrated the capacity to detonate nuclear devices, possess the means to deliver them, and are not party to the NPT."³ More frightening, however, is not their antagonistic attitude towards each other, especially concerning disputes over Kashmir, but more specifically that Pakistan is a safe-haven for violent extremists. If a coup or lapse in security were to occur in Pakistan, the question is, "...what would happen to its nuclear weapons?"⁴ Additionally, "With the potential for increased proliferation and growing concerns about nuclear security, risks are growing that future wars in South Asia and the Middle East would risk inclusion of a nuclear deterrent."⁵

³ U.S. Department of Defense. *Joint Operating Environment 2010*. Washington, DC: U.S. Department of Defense, (February 2010): 44

⁴ Ibid., p. 50

⁵ National Intelligence Council, *Global Trends 2030: Alternative Worlds*. Washington, DC: Office of the Director of National Intelligence, (December 2012): viii

Regarding Iran's ongoing commitment to procure nuclear weapons, and being the world's greatest sponsor of terrorism, the fourth trend that influences the posture of the US nuclear enterprise is Iran. Although Iran is a signatory to the Joint Comprehensive Plan of Action (JCPOA), elimination of the plan at the behest of a new US administration is feasible, if not entirely likely. As Iran's pledge to procure nuclear weapons remains steadfast and their JCPOA commitments reversible, Iran's enduring influence to the posture of the US nuclear enterprise remains obvious. In fact, regardless if the JCPOA is voided at the behest of the US, as stated by the Department of National Intelligence, National Counter-proliferation Center Director Lehnus, "The challenge is detecting or knowing when these states move from an agenda of developing civil nuclear-energy capabilities to developing nuclear weapons."⁶ In addition, as Iran continues to be the world's greatest sponsor of terrorism, their activities alone in effect promote nuclear terrorism on a global basis as they provide much of the rhetoric and means to either entice or acquire nuclear weapons.

Statement of the Problem

Taking into account the enduring and pervasive nature of complexity in the global security environment, and the threats that will likely evolve, this paper attempted to answer the question of how do current and future threats in the global security environment affect nuclear strategic deterrence posture.⁷

The purpose of this research was to examine in detail the complexity of current and future threats to effective nuclear strategic deterrence posture. Specifically, this research

⁶ Office of the Director of National Intelligence, National Counter-Proliferation Center, *A Closer Look Inside the National Counter-proliferation Center*, p. 3. Found at: <https://www.dni.gov/index.php/about/organization/national-counterproliferation-center-who-we-are>

⁷ Posture is defined by Narang in *Nuclear Strategy in the Modern Era: Regional powers and International Conflict* as "The incorporation of some number and type of nuclear warheads and delivery vehicles into a state's overall military structure, the rules and procedures governing how those weapons are deployed, when and under what conditions they might be used, against what targets, and who has the authority to make those decisions." Narang, Vipin, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict*. NJ: Princeton Press, 2015. p. 4

analyzed how the current and future global security environment out to the year 2035 affects the US nuclear enterprise from its ability to successfully assure allies and deter belligerence from a host of regional and global actors. Realizing there is a multitude of disparate threats associated with the current and future global security environment as determined in the course of this research, ultimately the strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years.

II. LITERATURE REVIEW

In 2006, Dr. McDonough, (Author, and Research Fellow at Dalhousie University's Centre for Foreign Policy Studies, Canada), provides a scholarly account of the evolution of US nuclear deterrence strategy since its first use during World War II to coerce the Japanese to surrender, through strategy enacted during the second Bush Administration. The author describes in particular how US administrations for the last six decades attempted to pursue a coherent and viable strategy, and how "...the Cold War provides an important historical context for the changing nature of its nuclear strategy after the Cold War and, more specifically, for the debate over the Bush administration's more recent nuclear revisions."⁸

Commencing with the Truman Administrations brief period of nuclear monopoly, the author shows that though strategy for decades essentially progressed in accordance with nuclear capabilities on hand, but it was more in response to the capabilities that the US believed the Soviet Union possessed. In sum, the author delivers an informative discussion of how nuclear deterrence strategy evolved throughout presidential administrations in contextually disparate

⁸ McDonough, David S. "The Evolution of American Nuclear Strategy." *The Adelphi Papers* 2006, vol 46, no. 383 (2006): 13

periods of contemporary history, and by examining this literature will undoubtedly provide strategic insight into this research.

In 2014, Johnson and Kelly, (respectively, Senior Defense Research Analyst at RAND, and Director, Strategy, Doctrine, and Resources Program at RAND Arroyo Center), deliver a scholarly article examining specific changes to the future security environment, positing that a strategy or tailored deterrence is necessary to determine “...the right balance of capabilities in Joint Force 2020.”⁹ The authors specifically target for discussion three relevant changes to the security environment that solicit required change in strategy; China’s growing hegemony in the Asia-Pacific, a reduction in defense spending and “...the increasing convergence of rogue states, nuclear proliferation, cyber warfare, regional instability, and transnational terrorism in places such as North Korea, Iran, and Syria.”¹⁰

In the article, Johnson and Kelly argue aptly that the current defense strategy is pursuing the wrong path in its investment strategy, and is “...overinvesting in offensive capabilities to defeat China in Air-Sea Battle when a defensive posture to strengthen partnerships and use A2/AD capabilities to deny Chinese power projection, combined with the risk of conventional and nuclear escalation.”¹¹ Concurrently, the author’s also posit that the US is “...underinvesting in combined arms capabilities to defeat regional powers such as North Korea and secure WMD in a failing state such as North Korea or Syria.”¹²

Ultimately maintaining a defense strategy based on tailored deterrence is a fitting approach as presented by the author’s, especially as complexity in the global security environment expands, and it becomes a prerogative to use “...principal future challenges to U.S.

⁹ Johnson, Michael, and Terrence K. Kelly. “Tailored Deterrence: Strategic Context to Guide Joint Force 2020.” *Joint Force Quarterly*, no. 74 (3rd Quarter 2014): 22

¹⁰ Ibid.

¹¹ Ibid., p. 28

¹² Ibid.

national security interests as the basis for deriving realistic force-planning scenarios, military missions, and joint forces.”¹³

In 2005, Dr. Rajagopalan, (Associate Professor in International Politics at the School of International Studies, Jawaharlal Nehru University, New Delhi), provides a scholarly account of the effects and consequences of the possession of nuclear weapons in South Asia by Pakistan and India and the continuing issues of debate between optimists and pessimists. Specifically, on one side of the equation, “...proliferation optimists argue that the spread of nuclear weapons is not only not worrying, but that it might actually have a soothing effect on regional conflicts.”¹⁴ While on the other side of the equation, “Proliferation pessimists disagree, arguing that the spread of nuclear weapons increases the probability that nuclear weapons will be used.”¹⁵

As described by the author, numerous issues for continued debate still exist between the two nuclear states, to include ongoing efforts at deterrence between India and Pakistan, as well as command and control systems, civil-military relations, employment strategies, and the vulnerabilities of each state. The author adroitly examines these issues writ large, but importantly ties in a particularly frightening yet potentially realistic scenario, “...the issue of the unintended use of nuclear weapons.”¹⁶ As described, the unintended use of nuclear weapons consists of four separate categories: inadvertent escalation, unauthorized use, loss of possession, and nuclear accident.¹⁷

¹³ Johnson, Michael, and Terrence K. Kelly. “Tailored Deterrence: Strategic Context to Guide Joint Force 2020.” *Joint Force Quarterly*, no. 74 (3rd Quarter 2014): 22

¹⁴ Rajagopalan, Rajesh. “The Threat of Unintended Use of Nuclear Weapons in South Asia.” *India Review* 2005, vol. 4, no. 2 (April, 2005), p 214

¹⁵ Ibid.

¹⁶ Ibid., p. 215

¹⁷ Dr. Rajagopalan defines unintended use of nuclear weapons as follows: Inadvertent Escalation - use of nuclear weapons as a consequence of escalation pressures during crises and war; Unauthorized Use - use of nuclear weapons by military commanders without authorization by the political leadership; Loss of Possession - possibility of nuclear weapons being stolen and used by terrorists, and; Nuclear Accident – self-explanatory. Rajagopalan, Rajesh. “The Threat of Unintended Use of Nuclear Weapons in South Asia.” *India Review* 2005, vol. 4, no. 2 (April, 2005): 215

Overall, Dr. Rajagopalan expertly examines the possibility of an unintended use of nuclear weapons in South Asia taking into account the peculiarities of this region, specifically the proximity of India and Pakistan, and concludes "...South Asian nuclear adversaries are believed to make each of the four dangers of inadvertent use of nuclear weapons even greater than is normally the case."¹⁸

In 2005, Karnard, (Author and Research Professor in National Security Studies at the Centre for Policy Research, New Delhi, India), provides another compelling and scholarly article discussing nuclear concerns in South Asia with India and Pakistan. The authors premise discusses the fact that "Deterrence theory can, perhaps, make clear how and why the Cold War between the two superpowers...did not turn hot. But it cannot adequately explain the face-off between a nuclearized India and Pakistan."¹⁹

By applying classical deterrence theory to the particulars of South Asia, Karnard argues that although deterrence has worked thus far, essentially "Very little theorizing has been done about the workings of deterrence between two manifestly unequal states, and what little there is has grave weaknesses."²⁰ By utilizing a Cold War template (and mindset) of near peer competitors, (i.e. the Soviet and the US), and their immense military capabilities, Karnard argues it does not rightfully account for the discrepancies which exist between Pakistan and India, in particular military capabilities.

Overall, the author effectively argues that specific factors exist in South Asia between the two countries that render the chance of a nuclear exchange unlikely. Some of these factors include, "...the close social and cultural linkages...a completely unbalanced "exchange ratio"...

¹⁸ Rajagopalan, Rajesh. "The Threat of Unintended Use of Nuclear Weapons in South Asia." *India Review* 2005, vol. 4, no. 2 (April, 2005): 219

¹⁹ Bhartat, Karnad. "South Asia; The Irrelevance of Classical Nuclear Deterrence Theory." *India Review* 2005, vol. 4, no. 2 (April, 2005): 173

²⁰ Ibid.

Pakistan's deterrent posture relies on India's sufferance for its success and India can challenge or undermine it...and, finally, the United States' military entrenchment in Pakistan post-9/11..."²¹

In 2015, Admiral Haney, (Commander, United States Strategic Command), provides a peer-reviewed article articulating the fact that for over seven decades the United States has effectively been able to "...deter adversaries and assure our allies and partners of the US commitment to collective defense, even as our security environment is more diverse, complex, and uncertain than ever."²² Though the article emphasizes the US ability to deter in the past, more importantly, Admiral Haney argues that certain nation-states and non-state actors continue dedicated efforts at proliferation through various means to include modernization efforts, and ways, such as utilizing mobile, hardened, and underground venues.

In particular, Admiral Haney discusses efforts that Russia, China, and North Korea are undertaking that continue to influence regional and global stability, for instance the fact that "Russia is investing and modernizing across all legs of its nuclear triad and is demonstrating selective compliance with international accords and treaties."²³ Additionally, in context to PRC efforts, it is "...modernizing its nuclear forces, which include silo-based intercontinental ballistic missiles (ICBM), road-mobile ICBMs, and ballistic missile submarines."²⁴ In regards to North Korea, they continue "...to increase tensions with threats of more nuclear tests. It also claims to have possession of a miniaturized warhead and has been noted for parading a road-mobile ICBM KN-08 missile that it says is capable of reaching the western United States."²⁵ More importantly though, Admiral Haney successfully argues the requirement of the US to "... sustain and modernize our nuclear, space, and cyber forces and their associated delivery platforms—many of

²¹ Bhartat, Karnad. "South Asia; The Irrelevance of Classical Nuclear Deterrence Theory." *India Review* 2005, vol. 4, no. 2 (April 2005): 174

²² Haney, Adm Cecil D. "Strategic Deterrence for the Future." *Air & Space Power Journal* 29, no. 4 (July 2015): 4

²³ *Ibid.*, p. 6

²⁴ *Ibid.*

²⁵ *Ibid.*, p. 5

which have been in service far longer than was originally planned or designed.”²⁶

Finally, the peer-reviewed article prepared in 2015 by Dr. Ekmektsioglou, (Fellow at the Center for Strategic and International Studies, Washington, D.C.), is an intriguing account of the development and intended use of hypersonic weapons by the US and China. In particular, the author adeptly advances the criticality of “...understanding regarding state decisions to adopt hypersonic weapons and the impact of such systems on state behavior, escalatory dynamics, and systemic power distribution needs to be deepened.”²⁷

Though the US remains transparent in its pursuit to obtain hypersonic weaponry as part of the Conventional Prompt Global Strike (CPGS) program, the author thoughtfully conveys, “...nations pursue hypersonic technology in secrecy; therefore, we have little information regarding the stage of development the Russians or Chinese have achieved.”²⁸ This is of critical concern as once technological maturity takes place and nation-states, rogue nations, or possibly non-state actors acquire the means necessary to utilize this weaponry becomes available, regional and even global stability complexes will become affected. Notably though, US commitment to the program is sound, “...especially after hypersonic weapons survived sequestration and their plethora of testing failures notwithstanding, US civilian and military circles appear to be deeply invested in the further development of these systems.”²⁹

Overall, the author delivers a well-written account of concerns regarding use of hypersonic weaponry in the US inventory, and more alarming, in possession of adversaries. This information will certainly inform this research, as game changing technology will in due course affect the strategic nuclear deterrence posture of the US.

²⁶ Haney, Adm Cecil D. "Strategic Deterrence for the Future." *Air & Space Power Journal* 29, no. 4 (July 2015): 5

²⁷ Ekmektsioglou, Eleni. "Hypersonic Weapons and Escalation Control in East Asia." *Strategic Studies Quarterly* 9, no. 2 (Summer 2015): 43

²⁸ Ibid.

²⁹ Ibid., p. 48

In summation, conducting this literature review presented a great deal of information relative to the dependent variable and independent variables, and more importantly conveyed gaps relative to this research and the primary research question of how do current and future threats in the Joint Operating Environment affect nuclear strategic deterrence posture? Though this literature review did not include findings procured via the *Joint Operating Environment 2035* that is relative to this research, the document will inform the final product as it aptly describes the future security environment in 2035. Finally, this literature review also provided requisite avenues of further exploration likely to credit (or discredit) the preliminary thesis.

III. METHODOLOGY AND RESEARCH STRATEGY

Researching the complexity of how current and future threats in the joint operating environment affect nuclear strategic deterrence posture required a qualitative research approach utilizing predictive analysis. This is due to several reasons to include the complexity of the preliminary thesis, and regarding quantitative research methods, unavailability of verifiable statistical data directly applicable to the research question.

Examination of the dependent variable, (nuclear strategic deterrence posture), required a review of specific US government documents to include the *2015 National Security Strategy* to examine the intent and desired long-term strategic objectives of the US, and a review of the *2010 Nuclear Posture Review*, required to understand the specifics of current US nuclear enterprise weapons policies and posture. Further examination of the dependent variable also included an examination of the strategy and theory of nuclear deterrence utilizing various peer-reviewed and scholarly articles, as well as applicable government documents.

The first independent variable, “The Future Global Security Environment”, was examined primarily through analysis and extrapolation of data found primarily in the *Joint*

Operating Environment 2035. My second and third independent variables, respectively “The Status Quo but Things are Improving” and “The Status Quo but Things are Getting Worse”, was studied through examination of relevant documentation prepared by the Congressional Research Service, RAND Corporation, and certain peer-reviewed and scholarly articles. The fourth independent variable, “Occurrence of a Game Changing Event”, includes examination and discussion of the introduction of new technology, impact of an unforeseen regime change in a nuclear state, and introduction of a black swan event. Subsequent research followed the same approach as investigation of the aforementioned independent variables.

IV. FINDINGS AND ANALYSIS

Analysis conducted in this research provided a multitude of findings applicable to the research question of how do current and future threats in the JOE affect nuclear strategic deterrence posture and hypothesis that strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years. The below is a compilation of findings procured through examining depiction of the future global security environment, as well as analyzing three credible future scenarios which will weigh in on the outcome of this research.³⁰

The Future Global Security Environment

As shown in the *Joint Operating Environment 2035*, the Department of Defense’s description of the global security environment in 20 years, the future global security environment, much like the current global security environment, remains rife with inherent complexity and, therefore, difficult to approximate. It is, however, described in an appropriate

³⁰ As described by Swartz in *The Art of the Long View*, “The purpose of scenarios is to help yourself change your view of reality to match it up more closely with reality as it is, and reality as it is going to be.” Schwartz, Peter. *The Art of the Long View*. New York, NY: Crown Publishing Group, (1991, 1996): 9

manner by utilizing “...two distinct but related sets of challenges. The first is *contested norms*, in which increasingly powerful revisionist states and select non-state actors will use any and all elements of power to establish their own sets of rules...The second is *persistent disorder*...”³¹

Analyzing each of these sets of challenges in the context of both the primary research question and hypothesis provided helpful findings regarding the capabilities and intentions of potential adversaries and more importantly their influence to the US nuclear enterprise writ large. Specifically, “...there will be a significant evolution in long-range strike weapons capable of ranging the U.S. homeland. Russia will modernize its land, air, and sea-based intercontinental nuclear forces.”³²

In addition, findings show that, “China’s recent industrial and economic growth combined with its desire to once again be a regional hegemon and global power may result in new nuclear doctrine emphasizing first use and a counter force approach.”³³ As China continues to move towards economic parity with the US, this is intuitively a concern.

Concerning the possibility of a direct threat to the US homeland, findings also provided additional context to this research. More specifically, that “Future delivery mechanisms might include hypersonic missiles, long-range cruise missiles, and ballistic missiles with maneuverable warheads, all designed to penetrate U.S. defensive systems.”³⁴

Findings relative to analysis of the future global security environment illustrate that as information becomes more freely and rapidly transmitted in a covert manner due to an ever-increasing globalized world, nuclear weapons technology procured through illicit means is likely. Realizing that possession of technology to construct nuclear weapons is only part of the

³¹ U.S. Department of Defense. *Joint Operating Environment 2035*. Washington, DC: U.S. Department of Defense, (July 2016): 4

³² *Ibid.*, p. 25

³³ *Ibid.*

³⁴ *Ibid.*

equation, and there still exists a requirement for fissile material and hardware, as history has shown the safety and security of such material is still suspect and remains vulnerable in many nation-states such as Pakistan and Russia.

Findings also showed that when examining complexities in the future global security environment threats are also likely to come from both current nuclear states and non-state actors attempting to “pursue a rudimentary nuclear capability to establish a credible nuclear deterrent.”³⁵ Additionally, “Some states may attempt to “break out” of the Non-Proliferation Treaty regime and deploy dozens to hundreds of nuclear weapons on a range of delivery platforms...”³⁶ Ultimately, nuclear terrorism will continue to be a major concern in the future global security environment (as it is currently) particularly as nations continue to fragment and radicalism continues to spread worldwide.

Though the above discussion is not an all-inclusive list of threats in the future global security environment that will influence US strategic deterrence posture, the aforementioned will undoubtedly play a critical role at influencing any proposed changes to US nuclear deterrence strategy, modernization efforts, or the nuclear enterprise writ large.

The Future Scenarios

To provide context to this research and as a baseline for analysis, three scenarios tested the hypothesis and concurrently provided further clarity of the complexities involving threats in the future global security environment. This is primarily because “Scenarios are not about predicting the future, rather they are about perceiving futures in the present.”³⁷

³⁵ U.S. Department of Defense. *Joint Operating Environment 2035*. Washington, DC: U.S. Department of Defense, (July 2016): 6

³⁶ *Ibid.*, p. 6

³⁷ Schwartz, Peter. *The Art of the Long View*. New York, NY: Crown Publishing Group, (1991, 1996): 36

Status Quo but Things are Improving

The US has ardently remained committed for decades (most recently through the NEW START program) to increase transparency of US and Russian nuclear weapons programs, reduce the number of weapons in each nation's arsenal, decrease the number of deployed weapons, and reduce the number of launchers accessible. As this program has continued to pay dividends and the US and Russia remain on trajectory to meet prescribed obligations by 2021, initiation of NEW START II, though optimistic, is realistic and supports this scenario.

Implementation of a spin-off accord between the US and Russia that provides additional transparency, reduction in available arsenals and deployed weapons, and even restrictions on the type/yield capability of nuclear weapons, is no longer suspect, but rational. In addition, as transparency is a vital component to this type of program, initiating a distinct multilateral program enticing other nuclear weapon states to participate, (such as India and Pakistan), would enhance regional and global security immensely as well as provide a modicum of economic stability by staving off costs associated with nuclear proliferation efforts by impoverished nations.³⁸

China is a key actor in this scenario because although they have continued to modernize their weapon systems and delivery platforms, and pursue advanced technology to support each ideal, these actions continue to exact a huge financial burden. As economic growth continues to be China's primary concern due to an ever-increasing requirement to support a complex and tumultuous domestic agenda, (i.e. its population), it is intuitive for the Chinese to realize that capital spent on their nuclear enterprise equates to capital expended without an expected return on investment. Furthermore, as China is primarily concerned with regional threats and has in its

³⁸ This would be a natural progression of enduring US efforts at non-proliferation and attempts to further enhance the transparency of weapons programs between the US and Russia.

current arsenal a requisite number of nuclear weapons capable of inflicting catastrophic damage to a regional aggressor, this will likely entice China to curtail the use of its national treasure on its nuclear weapons programs in the future. Finally, as is evident, "...small nuclear arsenals, not large ones, are the global norm."³⁹

Realizing that regional stability indelibly promotes their agenda of economic growth, China, who in many regards plays the role of a big brother to the DPRK, will also reinvigorate efforts to relaunch the Six-Party talks with the DPRK in an effort to deter ongoing regional belligerence and DPRK attempts at nuclear proliferation. DPRK leadership for their part come to terms with their imminent demise, and rather than implode as a nation begin to normalize relations with regional actors and the west by adhering to international laws and regulations governing nuclear activities.⁴⁰

The relationship between India and Pakistan is another problem set involved in the scenario of a status quo, but things are improving. Though India and Pakistan each have nationalistic animosity seemingly ingrained in their respective DNA, it is possible that relations between the two countries become more stable. As India continues to grow and maintain its status as the world's most populous country, much like China, India's concerns remain committed to economic solvency in order to promulgate a better standard of living for millions of impoverished Indians, not on bolstering its nuclear enterprise, nor warring with Pakistan. This is especially pertinent "...if Indian growth does not rebound from its recent slowdown and India does not put more emphasis on rapid economic and technological development."⁴¹

³⁹ Forsyth, James Jr., "The Common Sense of Small Nuclear Arsenals." *Strategic Studies Quarterly*, (Summer 2012): 93

⁴⁰ Derived from Haynes, Susan T. "China's Nuclear Threat Perceptions." *Strategic Studies Quarterly*, (Summer 2016): 30

⁴¹ National Intelligence Council, *Global Trends 2030: Alternative Worlds*. Washington, DC: Office of the Director of National Intelligence, (December 2012): 75

Pakistan, for its part, and in concert with US and other NATO members, finally expresses a desire to diligently pursue and defeat within its borders safe-havens for extremist groups. Though there are serious challenges to overcome, Pakistan is committed to regional stability and “...has a vision of a security architecture for South Asia that seeks to address the sources of insecurity...”⁴²

The final two players in this scenario involve Israel and Iran. Israel has not formally declared itself to be in possession of nuclear weapons, but if it was to formally declare its status as a nuclear weapon state, and more importantly declare a policy of no first use, Israel would undoubtedly promote regional stability. In regards to Iran, if their recently denounced aspirations to acquire nuclear weapons via the Iran Nuclear Deal continues to endure, it will also assist in fostering some modicum of reasonable discourse with the west regarding nuclear weapons. Ultimately, “For the first time in nearly a decade, we have halted the progress of the Iranian nuclear program, and key parts of the program will be rolled back.”⁴³

Finally, to add additional credence to this scenario, it is also likely that subsequent Presidential administrations will remain (as in the past) committed to “...a safe, secure, and effective arsenal to deter any adversary, and guarantee that defense to our allies.”⁴⁴ In part, this equates to funding required modernization of weapons and command and control platforms, and maintaining each leg of the nuclear triad, a key component to maintaining a credible nuclear deterrent.

⁴² In a comprehensive security analysis of the region, former Ambassador of Pakistan to the US describes the vision as four main pillars. These include, “Nuclear and missile restraint by Pakistan and India; an agreement for conventional arms control in South Asia; peaceful resolution of all outstanding disputes and sources of tension, especially Kashmir; and economic and social revival of South Asia through regional cooperation and global integration, in order to address problems of poverty and deprivation.” Found at: <http://www.defencejournal.com/2002/march/security.htm>

⁴³ Remarks made by President Obama in Washington DC, delivered at the White House, Washington, D.C., Nov. 23, 2013. Found at: <https://www.whitehouse.gov/the-press-office/2016/01/17/statement-president-iran>

⁴⁴ Remarks delivered by President Obama in Prague, Czech Republic, April 5, 2009. Found at: <https://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-prague-delivered>

Status Quo but Things are Getting Worse

As discussed in the first scenario where the status quo exists but things are improving, the US remains committed to transparency and nuclear non-proliferation efforts between itself and Russia. Russia, however, in large part due to security concerns tied to its economic decline, ultimately may not comply with their obligations to the NEW START program and reduce their deployed arsenal, or in the event of compliance, continue their modernization efforts, to include potentially constructing low yield or tactical nuclear devices. Essentially, "...a Russia which fails to build a more diversified economy and more liberal domestic order could increasingly pose a regional and global threat."⁴⁵ If this occurred, it would oblige the US to adjust its current strategy and modernization efforts, to include reinvigoration of several components of its nuclear enterprise, to include capability and capacity.

China, for their part maintains their resolve to gaining regional hegemony and bringing Taiwan under their control, continues to modernize its nuclear weapons, and further promotes a determined effort at enhancing the global reach of its ballistic missiles. To complicate matters further in the region, China may reduce pressure on the DPRK to begin renegotiating non-proliferation efforts through the Six-Party Talks or other nuclear security summits. This will embolden the DPRK to continue along with its efforts at nuclear weapons proliferation, nuclear weapons testing, and constructing ballistic missiles with a global strike capability, especially as "North Korea see nuclear weapons as compensation for other political and security weaknesses, heightening the risk of their use."⁴⁶

To further support the scenario of a status quo but things are getting worse, Iran continues

⁴⁵ National Intelligence Council, *Global Trends 2030: Alternative Worlds*. Washington, DC: Office of the Director of National Intelligence, (December 20120): ix

⁴⁶ Ibid., p. x

to be a key player, though it remains unequipped with nuclear weapons. It is however likely that lifting sanctions in accordance with the Iran Nuclear Deal will provide Iran with the opportunity to operate effectively within the global economy and as such likely decide to renege on the Iran Nuclear Deal, determining it must proceed with its nuclear weapons program. If Iran were to procure nuclear weapons, as being the world's largest sponsor of terrorism, it would in effect, "...set off a mad dash by Saudi Arabia, Turkey, and others to acquire nuclear weapons of their own. The world's most volatile region would become a nuclear tinderbox waiting to go off...worst of all, with nuclear weapons, Iran could threaten all of us with nuclear terrorism."⁴⁷ This would thus promote further instability in the region, again affecting the US nuclear posture and consequently supporting this paper's hypothesis.

Although India and Pakistan remain committed to peaceful coexistence and nuclear nonproliferation, due to weak governance Pakistan remains effectively a protectorate for a multitude of extremist organizations and therefore advancing the likelihood of nuclear terrorism stemming from South Asia. In addition, "If future state-on-state conflicts occur, they will most likely involve multiple forms of warfare. Future wars in Asia involving Russia, China, or India and Pakistan would risk use of a nuclear weapon in addition to conventional military capabilities."⁴⁸

Still another appropriate consideration in examining this scenario concerns the ability of the US to maintain all three legs of the nuclear triad. For years, various legislators and critics of the nuclear triad have presented arguments that there is virtually no need for each leg of the triad, the US possesses a credible deterrent with only one or two legs, and it would be an immense cost

⁴⁷ Israeli Prime Minister Benjamin Netanyahu's address to the American Israel Public Affairs Committee, Washington, DC, 6 March 2012. Found at: <https://israeled.org/resources/documents/israeli-prime-minister-benjamin-netanyahu-addresses-aipac/>

⁴⁸ National Intelligence Council, *Global Trends 2030: Alternative Worlds*. Washington, DC: Office of the Director of National Intelligence, (December 2012): 67

savings by decommissioning one or more legs. With the effects of a downturn in the global economy, and the potential for another budget control measure instituted by Congress, severing any leg of the triad and would result in an overall degradation of the entire nuclear enterprise, therefore requiring a radical adjustment to the current US nuclear posture and strategy.

Occurrence of a Game-Changing Event

Findings show that truly game-changing events, although somewhat unlikely, in the context of this research require particular consideration as its influence will weigh heavily on the premise that the strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years.

In examining the possibility of game changing events, research indicated that the three most probable include introduction of new technology, the occurrence of an unforeseen regime change in a nuclear state, and the occurrence of a black swan event, such as the invention of a new weapon or technology that renders the US nuclear enterprise or its posture obsolete.⁴⁹

Regarding the introduction of new technology and its game-changing potential, this would include technological advances in hypersonic weapons, as well as, "...nanotechnology, directed energy, unmanned systems, and artificial intelligence (AI)."⁵⁰ Ultimately, the promulgation of either of these technologies in a mature or employable capacity by adversaries is a truly game-changing occurrence due to susceptibility of attack and potential vulnerability of the US nuclear enterprise. Again, this finding lends credence to the hypothesis that the strategy, modernization efforts, and force structure of the US nuclear enterprise must adapt and maintain the ability to deter current and emerging threats.

⁴⁹ A black swan event is defined here as an event that occurs which is completely unpredicted and causes massive consequences, in this case to the status quo of the US nuclear enterprise and US nuclear posture.

⁵⁰ James, Deborah Lee, Welsh, Mark A. III, *Air Force Future Operating Concept, a View of the Air Force in 2035*. Department of the Air Force: (September 2015): 17

As alluded to previously, an unforeseen regime change of a nuclear state is undoubtedly a game changing event. Pending upon which nuclear state a regime change occurs, a new government that is ambivalent in its strategy towards use of nuclear weapons, or a nation that is simply hostile to US intentions, will undoubtedly affect US strategic nuclear deterrence posture efforts.

Introduction of a black swan event as a game-changing occurrence is yet another topic of discussion relevant to this scenario and the overall hypothesis. Per definition, black swan events are theoretically unpredictable, but such an event is also reasonable to introduce due to its profound effects. For example, introducing a previously unknown technology to counter or defeat the use of nuclear weapons would decisively influence the US nuclear posture and lend credibility to the fact that the US nuclear enterprise must adapt to deter current and emerging threats.

Findings Summary

As the above findings have revealed, numerous factors including the inescapable though relatively unknown complexities of the future global security environment, as well as intricacies involving each scenario, undoubtedly support the hypothesis that strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years.

V. CONCLUSION

The purpose of this research was to examine in detail the complexity of current and future threats to effective nuclear strategic deterrence posture and analyze how these threats affect the US nuclear enterprise from its ability to successfully assure allies and deter belligerence from a host of regional and global actors.

As this research has shown, the variables utilized to conduct this analysis intending to either prove or refute the hypothesis proved beneficial in determining the outcome that actions by numerous key actors, to include four of the eight nuclear weapon states (and one undeclared state) exacerbate complexity in the future security environment, and influence US nuclear strategic deterrence posture. In addition, utilizing the three dissimilar scenarios assisted in further deliberation whereby each provided insight into just how culpable the US nuclear strategic deterrence posture is to a vast array of likely factors from even an optimistic outlook of the future.

As examined, Russian intentions also weighed heavily on the outcome of this research. Though the Cold War is long over and Russia continues its slow relative decline in the global economy, they also aspire to remain globally significant. With their recent actions in Crimea, the Ukraine and Syria, and their ongoing efforts at nuclear modernization, ultimately, "...a Russia which fails to build a more diversified economy and more liberal domestic order could increasingly pose a regional and global threat."⁵¹

To make matters even more discerning, political and economic instability, and security constraints remain a large part of this calculus. As such, "Nuclear powers such as Russia and Pakistan and potential aspirants such as Iran and North Korea see nuclear weapons as compensation for other political and security weaknesses, heightening the risk of their use."⁵²

As history has also shown, an overmatch and increase in both conventional and nuclear capabilities will inevitably promulgate assertive behavior, in this case on behalf of China, and lead to the inevitability of conflict with other key actors, to include Russia. Without another

⁵¹ National Intelligence Council, *Global Trends 2030: Alternative Worlds*. Washington, DC: Office of the Director of National Intelligence, (December 2012): ix

⁵² Ibid.

major global economic downturn affecting China's economy, (inarguably the center of gravity to its ability to enhance its nuclear enterprise), deterrence efforts will need to be adjusted or China will likely continue their rapid move towards regional hegemony and enhancement of their own nuclear surety. As the US continues to rebalance to the Asia-Pacific region, this is cause for alarm, supporting the argument that the strategy, modernization efforts, and force structure of the nuclear enterprise must adapt and maintain the ability to deter current and emerging threats in the next 20 years.

In regards to China's antagonistic little brother, the DPRK, absent the sudden demise of its current leader and a turn-around of the countries totalitarianism ways, their ongoing status as a nuclear-armed belligerent will remain on its current trajectory as international sanctions seem to further embolden their population, harden their leadership, and prove ineffective at stopping nuclear proliferation efforts. This leads to further reliability of the thesis that the strategy, modernization efforts, and force structure of the nuclear enterprise must adapt.

As examination of the dependent and independent variables have shown, there are many avenues of future research available to scholars who wish to explore in more detail the complexity of future threats to effective nuclear strategic deterrence. At a minimum, these could include a detailed examination of current US nuclear deterrence strategy and potential shortfalls, or examination of additional game changing technologies and potential black swan events and their potentially catastrophic influence on the nuclear surety of the US.

In summation, though this paper validated the hypothesis and the future threats to nuclear strategic deterrence are growing alongside the potential for proliferation of nuclear weapons, eventually all affected parties must be prescient of the fact that "It is impossible to certify when

deterrence is effective, only when it is not. If a war does not occur, how can anyone tell whether it was deterred or what means deterred it?”⁵³



⁵³ Tangredi, Sam J. "All Possible Wars? Toward a Consensus View of the Future Security Environment, 2001–2025." Institute for National Strategic Studies, McNair Paper 63 (November 2000): 27

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